Metcalf & Eddy

January 31, 2004

Mr. Kevin Adler
Remedial Project Manager
U.S. Environmental Protection Agency, Region 5
Office of Superfund, Remedial & Enforcement Response Branch
Mail Code SR-6J
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Subject: Granville Solvents Site, Granville, Ohio
Groundwater Extraction System Operational Changes

Dear Mr. Adler:

In an August 20, 2003, letter to U.S. EPA, Metcalf & Eddy of Ohio, Inc. (M&E), on behalf of the Granville Solvents Site Management Group, LLC, sought permission to change the operational strategy of the groundwater extraction system at the Granville Solvents Site (Site). M&E proposed to cease pumping from GSS-EW1 and increase pumping from GSS-EW2. The purpose of this proposed change was to improve the efficiency of the pumping system and the Removal Action by increasing the rate of contaminant removal in the vicinity of GSS-EW2 (the area of greatest impact), while still maintaining hydraulic control of impacted groundwater. Permission to make the proposed changes was granted by U.S. EPA on October 3, 2003. The purpose of this letter is to provide details on the activities undertaken since permission was granted and to report on the effects of the change in the pumping regime.

EXTRACTION SYSTEM BACKGROUND

The Granville Solvents Site Management Group, LLC, and its predecessor the Granville Solvents Site PRP Group have conducted Removal Action activities at the Site since 1994. The Site is located within the hydraulic influence of the Village of Granville well field, located to the west. A groundwater extraction and treatment system for the Site was placed into service on December 20, 1994, to provide hydraulic control of the impacted groundwater. The extraction system consists of two wells, GSS-EW1, located west or downgradient of the site, and GSS-EW2, located on the site near the former Granville Solvents, Inc. warehouse building.

During operation of both wells, the combined extraction rate ranged from 160 to 325 gallons per minute (gpm) with an average of approximately 250 gpm. Of this, EW-1 had historically been pumped at a rate of just over 150 gpm and EW-2 had been pumped at just under 100 gpm. Groundwater elevations are measured on a quarterly basis and a potentiometric surface map is plotted to verify that hydraulic control is maintained over the impacted groundwater. The locations of groundwater divides between the primary pumping centers have also been identified

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on the potentiometric maps. Cones of depression around the extraction wells have been observed in each potentiometric surface map, the shape and size of which have varied from period to period due primarily to variation in pumping rates of wells in the Village of Granville wellfield.

In spite of the variations, however, capture of impacted groundwater by the extraction wells has always been observed. The concentration of the chemicals of concern in the groundwater and the area where they exceed regulatory standards has been reduced since pumping began in 1994. It is estimated that the aquifer volume impacted with total VOCs above 5 ug/L has been reduced by 90 percent since 1994 and the maximum total VOC concentration present in groundwater has been reduced by nearly 80 percent.

The latest available (May 2003) plume configuration is illustrated in Figures 1, 2, and 3. It is apparent that the majority of the contaminant mass in the groundwater is beneath the former Granville Solvents, Inc. property. However, under the historical average operating conditions, over 60 percent of the groundwater extracted by the pump-and-treat system was from beneath the area west of the Site (well GSS-EW1). In 2001, the extraction volume from well GSS-EW2 was increased resulting in an observed rise in the concentration of chemicals of concern detected in the treatment system influent, indicating that the majority of the contaminant mass removed from the aquifer is removed from GSS-EW2.

An evaluation was conducted to determine the feasibility of modifying the flow rates from the extraction wells to provide hydraulic control of the impacted groundwater and increase the rate of contaminant removal. The Site groundwater flow model (M&E, 1998) estimated the effect of pumping at a higher rate from GSS-EW2 and turning GSS-EW1 off. The results indicated that pumping from GSS-EW2 at a rate of approximately 250 gpm would provide hydraulic control over the existing plume of impacted groundwater, increasing removal efficiency of the system while maintaining hydraulic control of impacted groundwater at the Site.

OPERATION CHANGE

Following granting of permission by U.S. EPA, GSS-EW1 was shut off on October 27, 2003, and the pumping rate from GSS-EW2 was increased to an average of 270 gpm. To monitor the effects of the changes, M&E measured water levels on several different occasions. The monitoring times were selected to measure the variations in the potentiometric surface induced by pumping of the Village of Granville water supply wells. The table below shows when water levels were measured, and which Village well was pumping at the time.

Date	Village Well in Operation
October 29, 2003	PW-2
November 3, 2003	PW-3
November 19, 2003	PW-4

A potentiometric surface map was prepared for each of the above dates (Figures 4, 5, and 6), with the latest plume configurations superimposed on each map.

Figure 4 represents a "worst-case," in which Village well PW-2, nearest the Granville Solvents Site, is pumping. As Figure 4 shows, however, even under this scenario, pumping well GSS-EW2 is able to capture impacted groundwater.

To determine the net effect of pumping from the three wells, the water levels measured on the dates above were averaged and used to generate a map (Figure 7) of the "composite" or average potentiometric surface. With respect to the position of the divide between GSS-EW2 and the Village wells, Figure 7 is a conservative estimate because it is not time-weighted, but assumes that PW-2 is pumped one third of the time that pumping is taking place. In actuality, the wells are utilized only as needed to meet the needs of the Village, and the Village pumps PW-2 the least often, preferring to pump wells PW-3 and PW-4 for greater than 70% of its needs. Figure 7 shows that, when all pumping wells are taken into consideration, the divide between GSS-EW2's influence and the Village wells' influence remains well westward of the points of compliance.

An additional advantage of the new pumping regime is that the current capture zone includes the area between GSS-EW1 and GSS-EW2, an area formerly occupied by a groundwater divide when both wells were in operation. The current pumping regime ensures that this entire area is subject to capture and free of stagnation.

The attached table lists the water level elevations measured on the various dates and also the averaged water levels that were used to produce the map of the average potentiometric surface. Due to the impact of well losses, the averaged elevation data from the Village pumping wells PW-2, PW-3 and PW-4 and the PH-series wells were not used in contouring the average surface. This does not affect the position of the divide.

WELL SURVEY

To ensure the greatest accuracy in evaluating the effects of the change in pumping strategy, all wells were resurveyed on December 17, 2003, by a licensed surveyor, and all the figures are based on the new survey.

These figures demonstrate that the new pumping regime has improved removal efficiency and is capable of maintaining hydraulic control of impacted groundwater. The Granville Solvents Site Response Management Group, LLC will continue to monitor pumping regime effectiveness and confirm plume capture by collecting regular groundwater elevation measurements and preparing quarterly potentiometric maps. If you have any questions regarding this report, please contact me at 614-890-5501.

Respectfully,

METCALF & EDDY OF OHIO, INC.

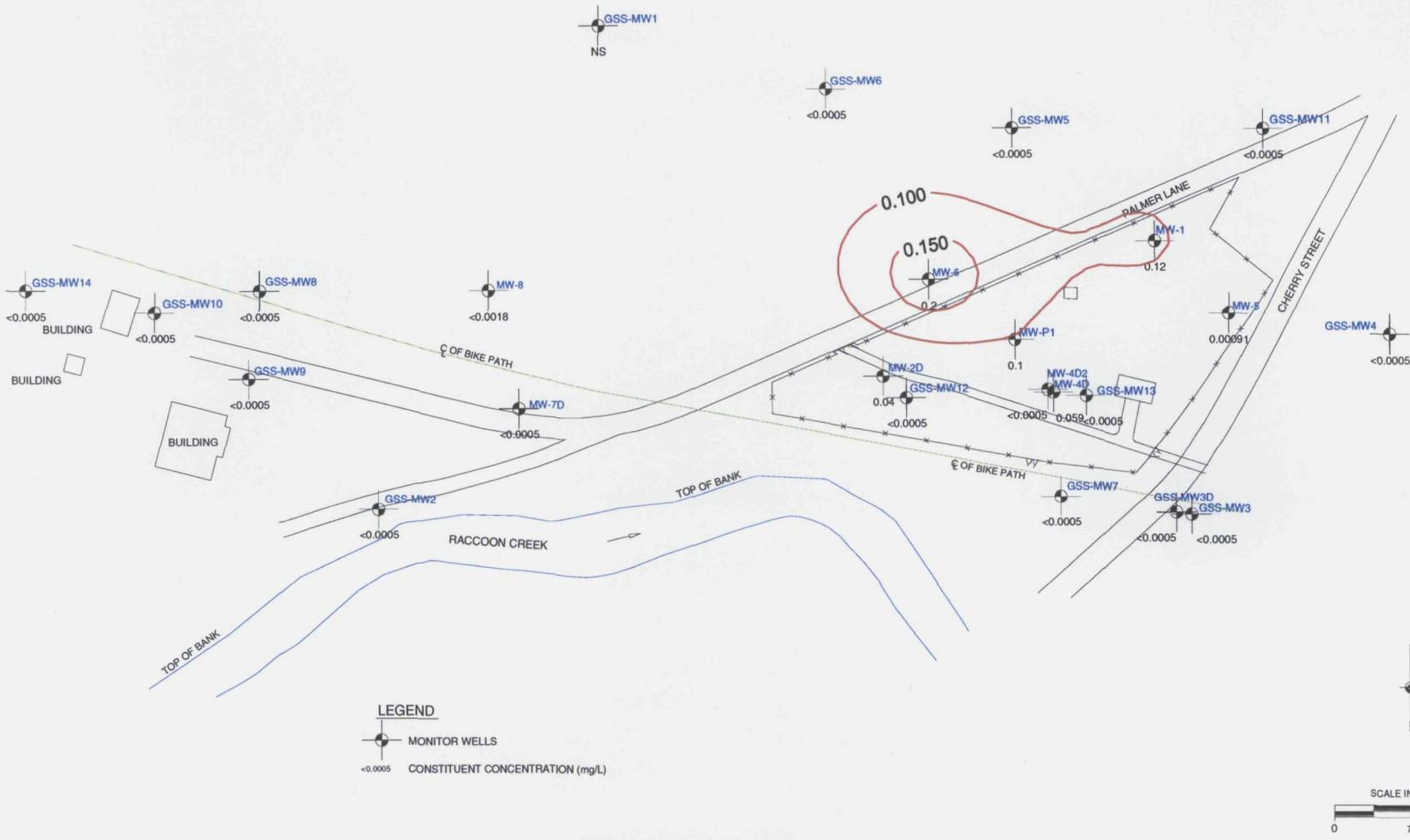
Gerald R. Myers
Vice President
Granville Solvents Site Project Coordinator

Attachments

cc: B. Pfefferle, Baker & Hostetler – Steering Committee Chairman
W. Brewer, Duke University – Technical Committee Chairman
B. Nelson, M&E – Project Manager
D. M. Jones, M&E

ATTACHMENT 1

FIGURES AND TABLE



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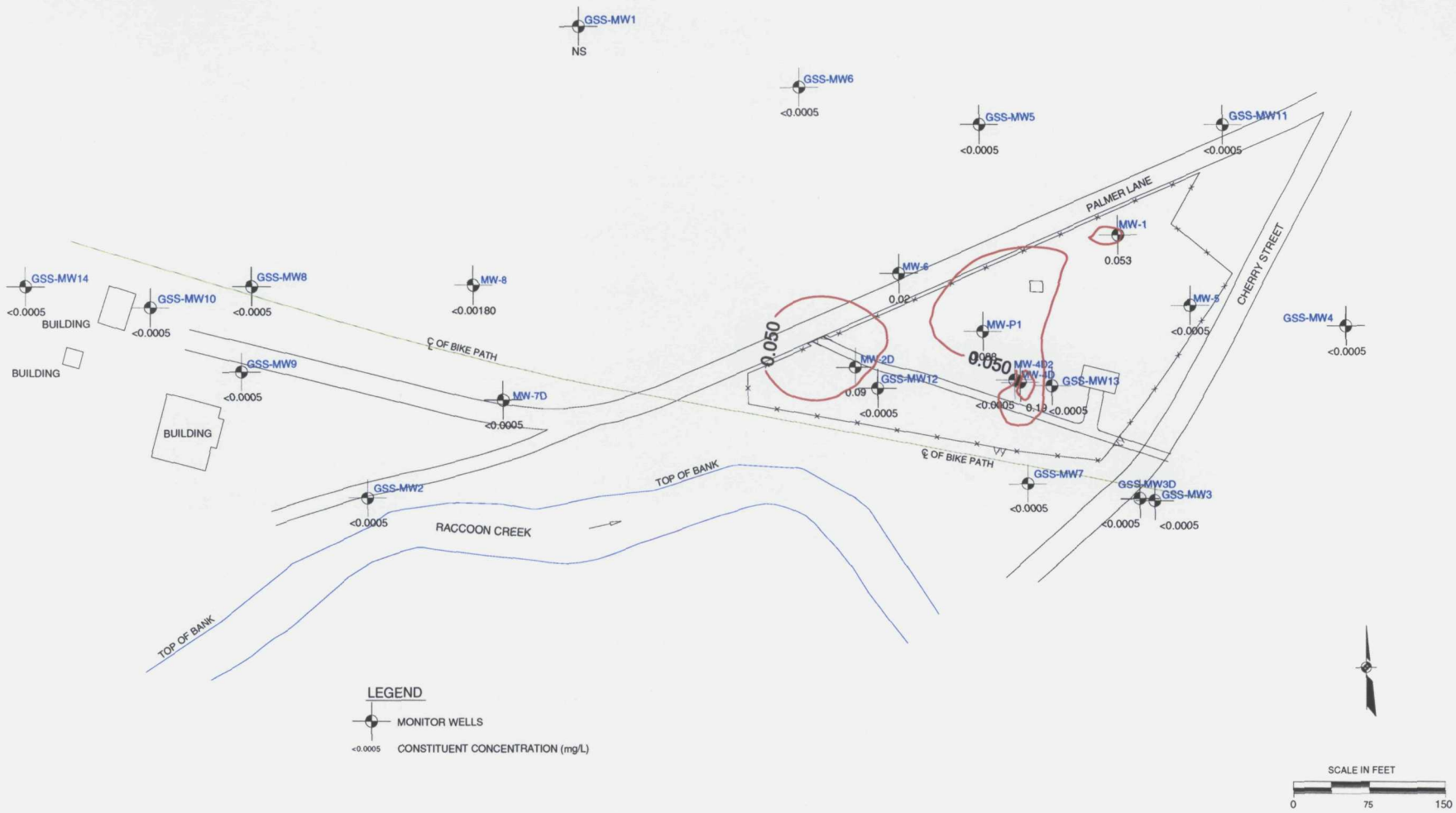
GRANVILLE SOLVENTS SITE

1,1,1-Trichloroethane (mg/L)
May 2003

GRANVILLE, OHIO

Project Number	
100178	
File Name	Figure
GSBASEMAP	1



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GRANVILLE SOLVENTS SITE

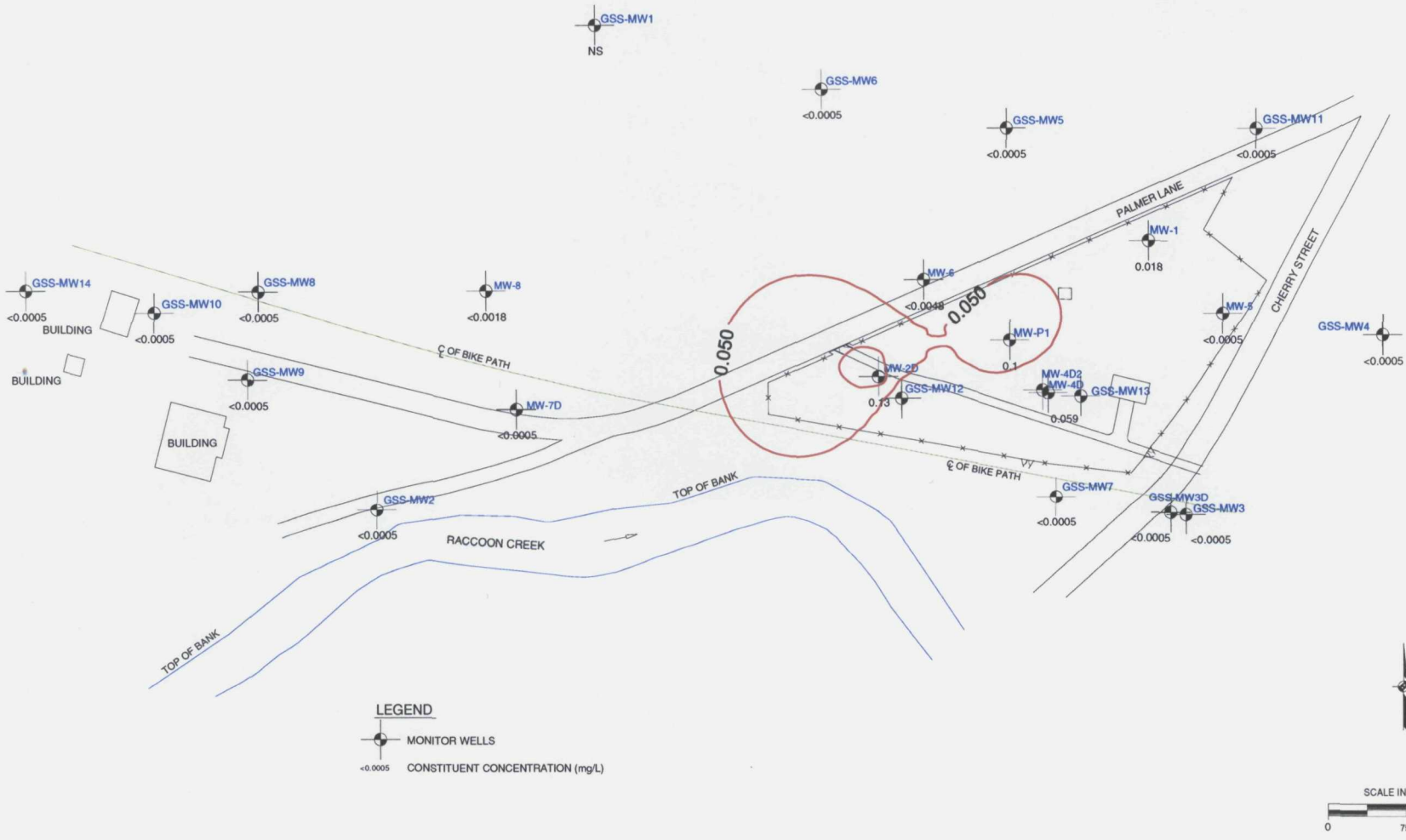
Trichloroethene (mg/L)
May 2003

GRANVILLE, OHIO

Project Number
100178

File Name
GSBASEMAP

Figure
2



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GRANVILLE SOLVENTS SITE

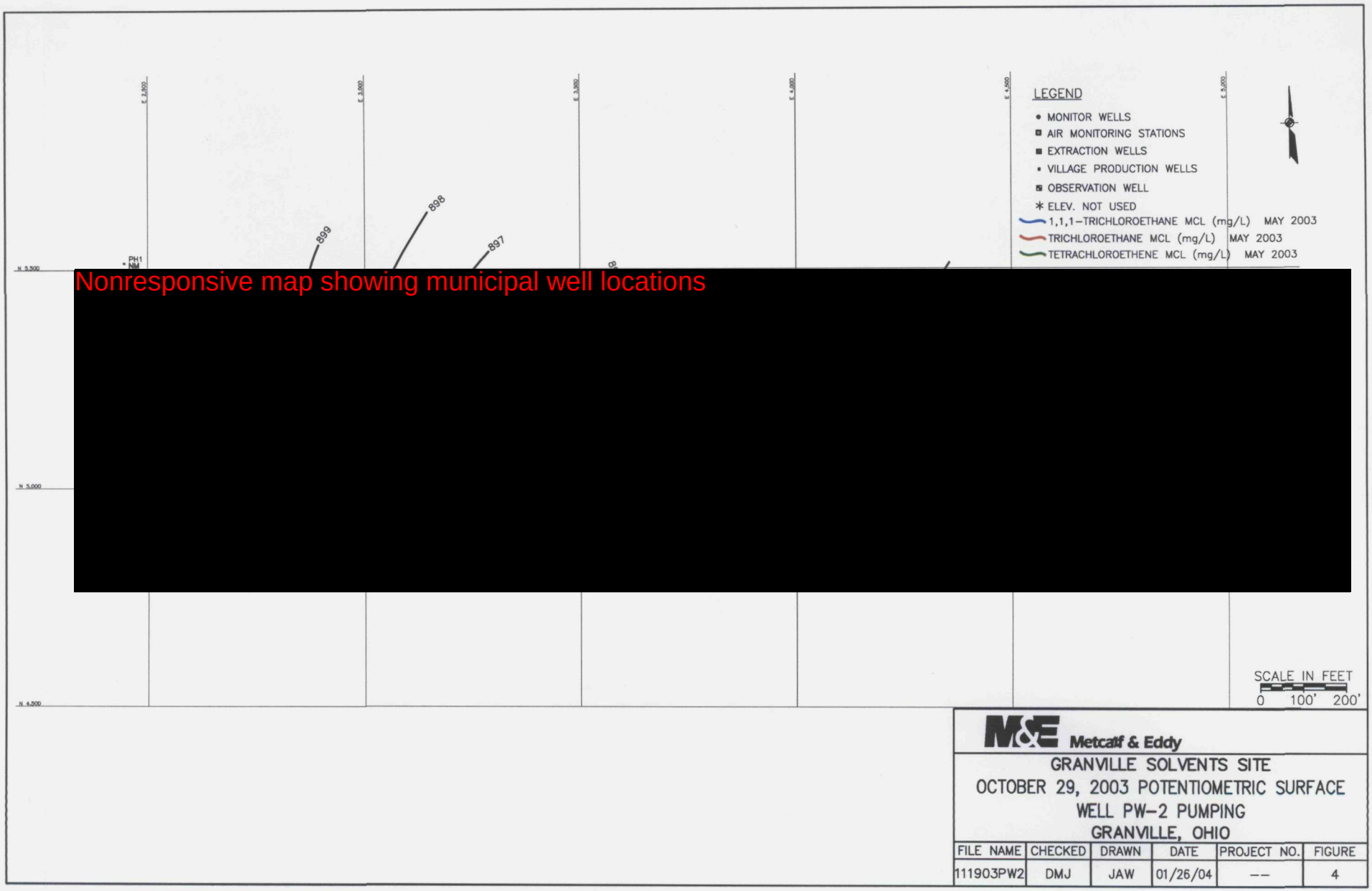
Tetrachloroethene (mg/L)
May 2003

GRANVILLE, OHIO

Project Number
100178

File Name
GSBASEMAP

Figure
3



Nonresponsive map showing municipal well locations

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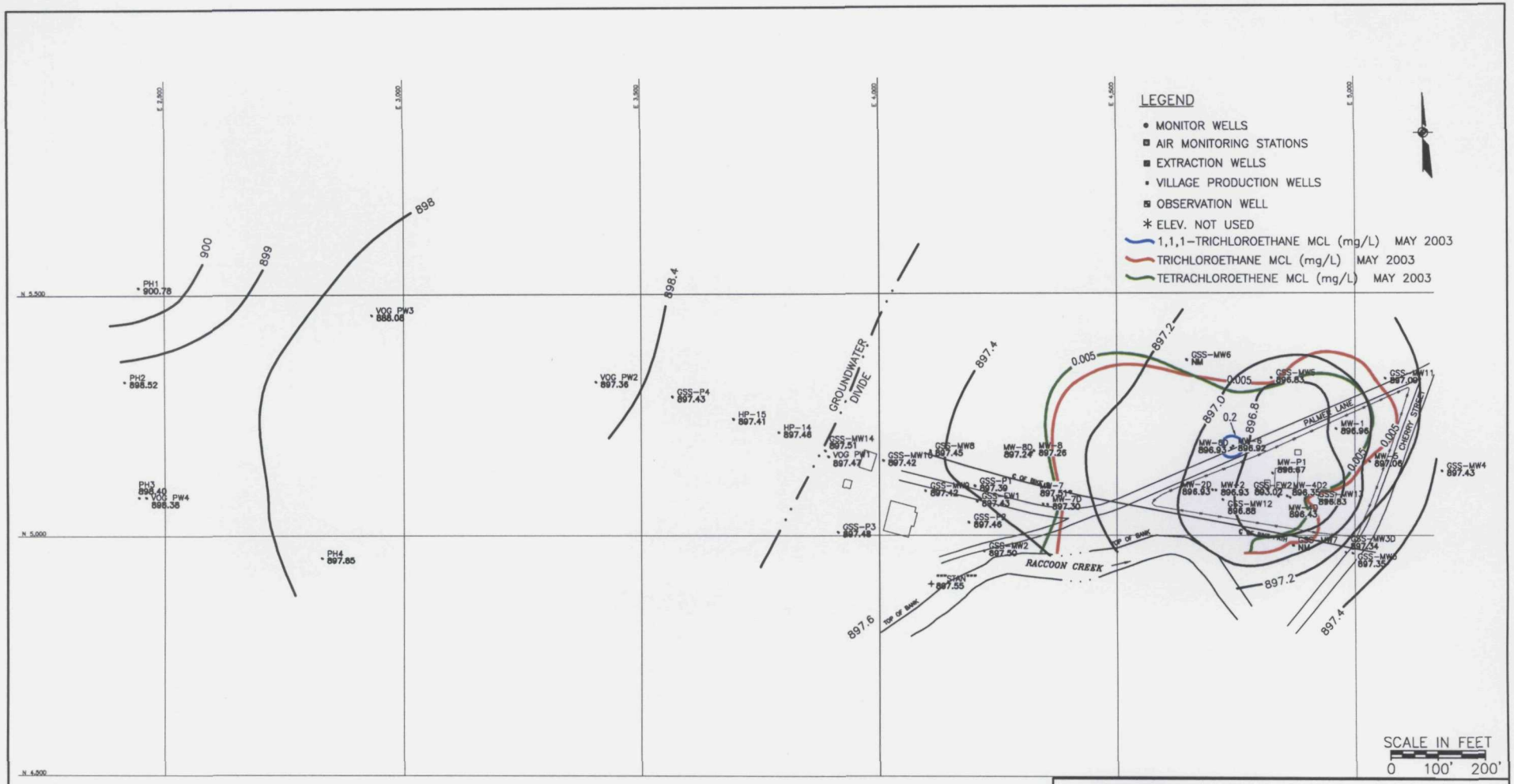
GRANVILLE SOLVENTS SITE
OCTOBER 29, 2003 POTENTIOMETRIC SURFACE
WELL PW–2 PUMPING
GRANVILLE, OHIO

FILE NAME	CHECKED	DRAWN	DATE	PROJECT NO.	FIGURE
111903PW2	DMJ	JAW	01/26/04	--	4



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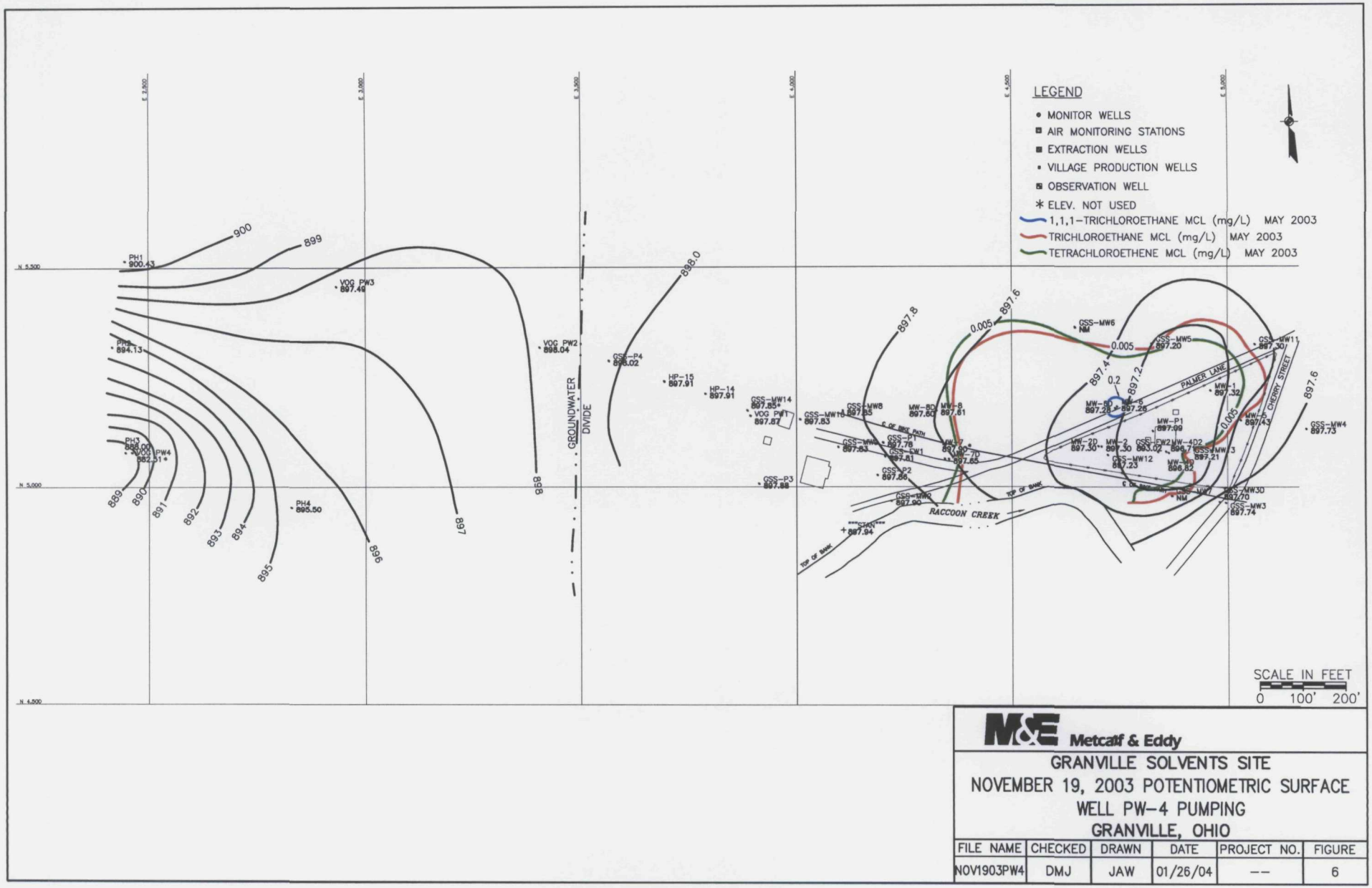
GRANVILLE SOLVENTS SITE
NOVEMBER 3, 2003 POTENTIOMETRIC SURFACE
WELL PW-3 PUMPING
GRANVILLE, OHIO

FILE NAME	CHECKED	DRAWN	DATE	PROJECT NO.	FIGURE
111903PW3	DMJ	JAW	01/26/04	--	5



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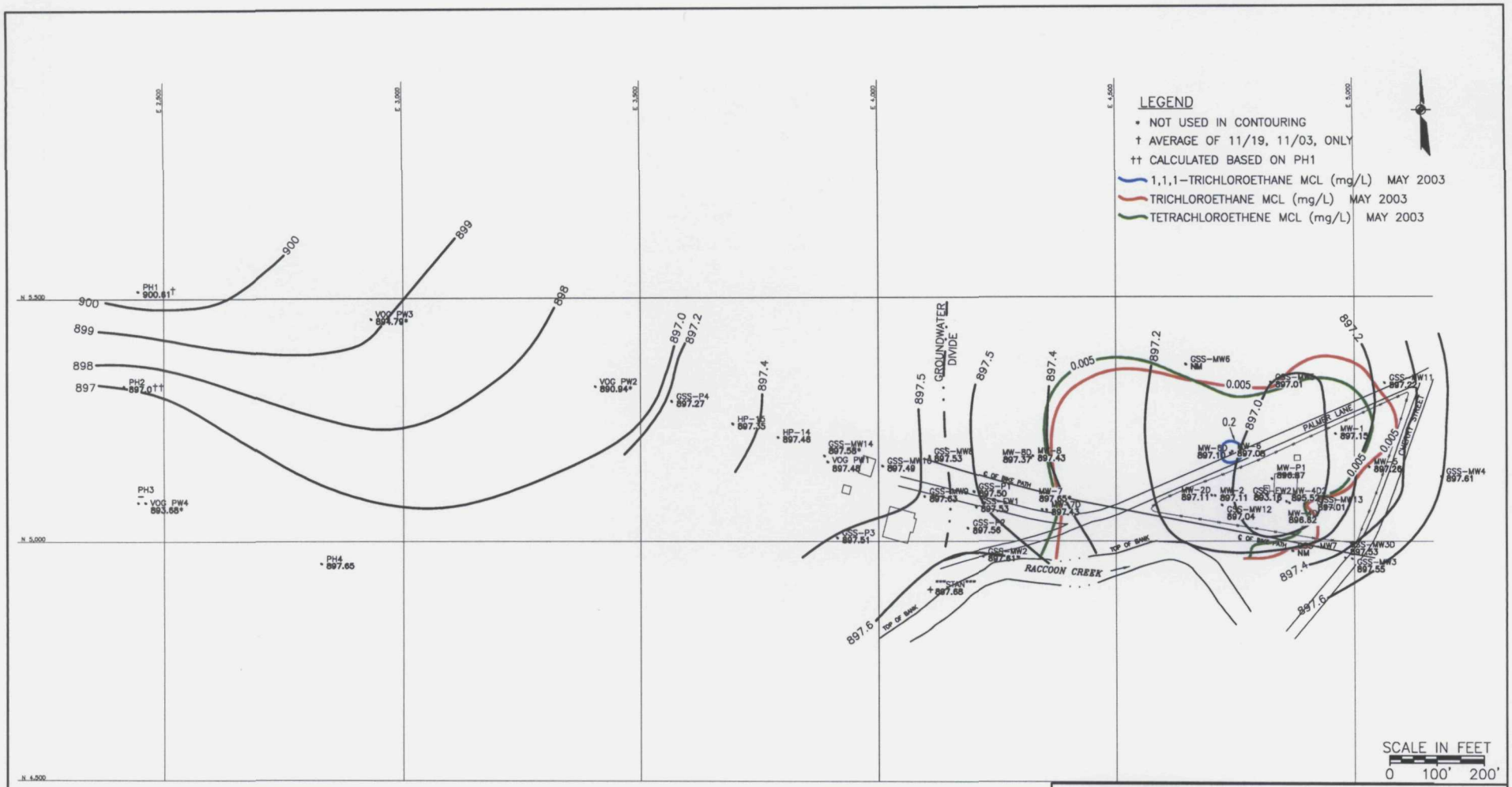
GRANVILLE SOLVENTS SITE
NOVEMBER 19, 2003 POTENTIOMETRIC SURFACE
WELL PW-4 PUMPING
GRANVILLE, OHIO

FILE NAME	CHECKED	DRAWN	DATE	PROJECT NO.	FIGURE
NOV1903PW4	DMJ	JAW	01/26/04	--	6



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GRANVILLE SOLVENTS SITE
AVERAGED POTENTIOMETRIC SURFACE
PW-2, PW-3, AND PW-4 PUMPING
GRANVILLE, OHIO

FILE NAME	CHECKED	DRAWN	DATE	PROJECT NO.	FIGURE
111903PW234	DMJ	JAW	01/26/04	--	7

GROUNDWATER DATA
GRANVILLE SOLVENTS SITE
METCALF & EDDY OF OHIO, INC.
Average Groundwater Elevations - Fall 2003

MONITORING WELL	GW ELEVATION 10/29/2003	GW ELEVATION 11/3/2003	GW ELEVATION 11/19/2003	AVERAGE GW ELEVATION
MW-1	897.17	896.96	897.32	897.15
MW-2	897.09	896.93	897.30	897.11
MW-2D	897.09	896.93	897.30	897.11
MW-4D (east)	896.61	896.43	896.82	896.62
MW-4D2 (west)	896.50	896.35	896.71	896.52
MW-5	897.28	897.06	897.43	897.26
MW-6	897.06	896.92	897.26	897.08
MW-6D	897.07	896.93	897.28	897.10
MW-7	897.52	897.51	897.90	897.65
MW-7D	897.35	897.30	897.65	897.43
MW-8 (PUMP)	897.31	897.26	897.61	897.39
MW-8D	897.28	897.24	897.60	897.37
MW-P1	896.84	896.67	897.09	896.87
VOC PW-	897.12	897.47	897.87	897.48
VOC PW-2	877.43	897.36	898.04	890.94
VOC PW-3	898.81	888.08	897.49	894.79
VOC PW-4 PUMPING	900.16	898.38	882.51	893.68
HP-14 (east)	897.02	897.46	897.91	897.46
HP-15 (west)	896.72	897.41	897.91	897.35
GSS-P1 (street)	897.35	897.39	897.78	897.50
GSS-P2 (lawn)	897.37	897.46	897.86	897.56
GSS-EW1 (FAR WELL)	897.36	897.43	897.81	897.53
GSS-EW2	893.15	893.02	893.32	893.16
STAN"	897.55	897.55	897.94	897.68
GSS-MW2	897.43	897.50	897.90	897.61
GSS-MW3 (EAST)	897.55	897.35	897.74	897.55
GSS-MW3D (WEST)	897.55	897.34	897.70	897.53
GSS-MW4	897.66	897.43	897.73	897.61
GSS-MW5 (EAST)	897.00	896.83	897.20	897.01
GSS-MW6 (WEST)	NM	NM	NM	NM
GSS-MW7 (PERCHED)	NM	NM	NM	NM
GSS-MW8	897.29	897.45	897.85	897.53
GSS-MW9	NM	897.42	897.83	897.63
GSS-MW10 (GARAGE)	897.20	897.42	897.83	897.49
GSS-MW11	897.25	897.09	897.30	897.22
GSS-MW12	897.03	896.88	897.23	897.04
GSS-MW13	896.99	896.83	897.21	897.01
GSS-MW14	897.38	897.51	897.85	897.58
GSS-P1	897.17	897.48	897.88	897.51
GSS-P2	896.36	897.43	898.02	897.27
P-1	NM	900.78	900.43	900.60
P-2	NM	898.52	894.13	896.33
P-3	NM	898.40	888.00	893.20
P-4	899.61	897.85	895.50	897.65

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